PRO-ACT
A Base-level Pollution Prevention Resource sponsored by HQ Air Force Center for Environmental Excellence

Success Story

APRIL 1999

Sheppard AFB

Introduction

Sheppard Air Force Base, located near the Oklahoma border in Wichita Falls, TX, is the largest and most diversified training wing within the Air Education and Training Command (AETC). Two organizations conduct resident training to qualify students for a broad range of career fields. The host 82nd Training Wing (82 TRW) conducts technical and medical training, and the 80th Flying Training Wing (80 FTW) conducts pilot training. The 82 TRW's training programs are administered and supported worldwide by four Training Groups. Every year, Sheppard AFB provides basic and advanced training to almost 49,000 officers, airmen, NCOs, and civilians pursuing a variety of fields including aircraft maintenance, civil engineering, electronics, telecommunications, nuclear weapons training, biomedical sciences, dentistry, law enforcement, and Euro-NATO Joint Jet Pilot training. Sheppard AFB has always been in the training business. In February 1941, the U.S. Army Air Corps leased over 600 acres near Wichita's Kell Field municipal airport and began the construction of $6 million worth of facilities to house an aircraft mechanic school. The new field was dedicated October 1941 in honor of U.S. Representative and Senator Morris Sheppard of Texas, Chairman of the U.S. Senate Military Affairs Committee, and a staunch advocate of military preparedness.

What's Inside...

Sheppard AFB assets include 97 T-37 "Tweet" jet aircraft, 125 T-38/AT-38B "Talon" jet aircraft, and almost 100 aircraft from inventory (F-15s, A-10s, etc.) used as trainers for enlisted students. The base contains about 1,120 buildings, has a total area of approximately 6,000 acres, and has a daily population of close to 23,500.

This publication highlights pollution prevention achievements at Sheppard AFB, including reductions in the use of hazardous materials, inventive approaches to integrated pest management, and reductions in the generation of solid and hazardous wastes. These successes can be emulated by other organizations to achieve similar results.

82nd Environmental Flight

Sheppard AFB's mission presents many unique environmental compliance and pollution prevention challenges. The 82nd Civil Engineer Squadron (82 CES) and the 82nd Environmental Flight (82 CES/CEV) have responded accordingly. Within the 82 CES/CEV are the Compliance (CEVC), Pollution Prevention (CEVP), Restoration (CEVR), and Plans & Programs (CEVX) sections.

Recognized as an environmental leader within AETC, staffs at Sheppard have proactively and creatively developed practical solutions to environmental problems. In October 1998, the 82 CES/CEV received the 1998 AETC Outstanding Civil Engineer Environmental Flight award. The award recognizes achievements in environmental compliance, restoration, pollution prevention and management of natural and cultural resources. The award called particular attention to Sheppard's recycling program, its successful negotiations with the State of Texas over Clean Air Act (CAA) issues, the development and implementation of an aggressive tree planting program, irrigation of the base golf course with treated wastewater effluent, and conducting the most comprehensive ECAMP in installation history. Sheppard is also a leader in the Air Force for its reduction of chemical pesticide use and promotion of biological pest control methods.

The Environmental Management Program

In August 1995, an installation-wide cross-functional development team determined that the best way to manage the overall environmental program at Sheppard AFB was through the use of Environmental Unit Coordinators (EUCs, SAFB Instruction 32-7002). In addition, in early 1997, the base Environmental Protection Committee (EPC, SAFB Instruction 32-7003) was reorganized along five environmental pillars:

- Compliance;
- Restoration;
- Pollution Prevention;
- Conservation; and
- Emergency Response.

Each pillar is assigned a UEC representative from each base group and major tenant. Representatives for each pillar are chartered with specific responsibilities for developing policies, goals, and tracking mechanisms for approval by the EPC.

This realignment of the base's environmental management program has been very successful in establishing, and achieving, pollution prevention goals. Since the realignment, Sheppard AFB has eliminated or significantly reduced as many as eight separate hazardous waste streams through:

- Increasing solid waste recycling by 40 percent to 1400 tons annually (23 percent of total solid waste stream);
- Reducing Environmental Compliance Assessment and Management Program (ECAMP) findings by 50 percent;
- Implementing a composting program;
- Initiating a comprehensive environmental assessment (EA) of the base to eliminate single action EAs;
- Eliminating unnecessary storm water permit requirements; and
- Reclassifying several stationary air emission sources to mobile sources, thereby removing the "Major Source" categorization under the CAA for the installation.

A key component in these successes is the "buy-in" from the installation's senior leadership. The policy of "Maintaining an Environmentally Sound Installation through Compliance with Laws and a Proactive Pollution Prevention Program," provides environmental management program managers with both a solid foundation to build upon, and the flexibility to achieve goals through new and innovative approaches. One of these approaches is the implementation of an International Organization for Standards (ISO) 14000-based Environmental Management System (EMS).

Due in large part to its past success, Sheppard AFB was selected by HQ USAF as one of three Air Force installations (along with Robins AFB, GA and Eglin AFB, FL) to participate in a Department of Defense (DoD) ISO 14000-based EMS Pilot Project (see Figure 1. "ISO 14000 Series Overview"). The foundation for successfully implementing ISO 14001 was already present in Sheppard AFB's UEC and EPC environmental management structure. In addition, Sheppard's North American Treaty Organization (NATO) mission requires that it consider European/ International environmental management techniques. Implementing ISO 14000 Series standards is a natural evolution of this requirement. The Pilot Project at Sheppard AFB began in January 1998 and will conclude in December 1999.

Figure 1. **ISO 14000 Series Overview**

International Organization for Standardization (ISO) 14000 Series Overivew

ISO 14000 is a group of globally accepted standards covering the following areas:

- Environmental Management Systems (ISO 14001,***** 14002, & 14004);
- Environmental Auditing (ISO 14010, 14011, & 14012);
- Evaluation of Environmental Performance (ISO 14031);
- Environmental Labeling (ISO 14020, 14021, 14022, 14023, 14024, & 14025); and
- Life-Cycle Assessment (ISO 14040, 14041,14042, & 14043).

***ISO 14001** is a management standard, not a performance or product standard. The underlying purpose of ISO 14001 is to provide a standard for an organization seeking to improve the management of its environmental responsibilities.

Some unique and important characteristics of ISO 14001:

- ***It is a systems approach:*** It stresses improving environmental protection by employing a single EMS across all functions of the organization;
- ***It is comprehensive:*** The EMS aspect of ISO 14001 considers all stakeholders and all environmental impacts. All members of an organization participate in environmental protection; and
- ***It is proactive:*** It focuses on forward thinking and action instead of reacting to command and control policies.

An EMS contains many elements, including:

- Top management support of environmental policy;
- Identification of significant environmental issues and impacts;
- Environmental goals, objectives, and targets that support the policy;
- Definition of roles, responsibilities, and authorities;
- Training and awareness procedures;
- Process for communication of the EMS to all interested parties;
- Document and operational control procedures;
- Procedures for emergency response;
- Procedures for monitoring and measuring operations that can have a significant impact on the environment;
- A program for auditing and corrective action; and
- Procedures for management review.

Although the results of the Pilot Studies at the three selected bases will help DoD establish an official EMS policy, implementation of the ISO 14001 Pilot Project at Sheppard AFB is expected to further establish and reinforce its existing "bottom-up" approach to addressing environmental problems. The anticipated benefits of the ISO 14001 Pilot Project are:

- Elimination of environmental risks and the associated cost of environmental management, including waste disposal, permitting, environmental sampling, and regulatory fees;
- Reduced scrutiny from state regulators due to a proven/certified standard for environmental management;

- Heightened awareness of the environmental impacts of the day to day mission, thereby allowing proactive pollution prevention at the shop level;

- Integration of environmental awareness into the technical training received by students at Sheppard AFB; and

- A clear demonstration that Sheppard AFB is a responsible steward of its natural resources.

According to Mr. John Keoshian, Sheppard AFB's Environmental Flight Chief, "The EMS is a systematic review of environmental issues for every process on base. It should be seen as a method for identifying, prioritizing, and addressing environmental risk." Because Sheppard AFB is a DoD test site for EMS, HQ AETC will accomplish an EMS audit in place of a conventional ECAMP assessment. The audit will be conducted in July 1999 and will follow the world standards for environmental auditing contained in ISO 14011 and ISO 14012 documents. This audit will help HQ AETC learn how to improve the ECAMP system by moving from a checklist-based assessment to a review of the EMS.

For further information, contact Mr. John Keoshian, 82 CES/CEV, Sheppard AFB, TX, DSN 736-6480.

Integrated Pest Management

The Sheppard AFB pesticide program is a leader in DoD for total pesticide reductions. Mr. Jimmy Lindsey, Entomology Section, 82 CES/CEOHH, uses an integrated management approach to pest control that opts for the use of biological control agents rather than the traditional use of chemicals. Based on a 1993 baseline, Sheppard AFB has successfully reduced the use of the following chemicals: fy

Chemical	*FY 1993 Usage (Baseline)*	*FY 1998 Usage*	*% Reduction FY 1993-1998*
Herbicide Pre-Emergent	736 lbs	0 lbs	100%
Herbicide Post-Emergent	646	156	76
Household Pesticide	449	112	75
Ornamental Pesticide	185	8.2	96
Termiticide	56	42	25
Mosquito Adulticide	108	0	100
Mosquito Larvacide	5	0	100
Rodenticide	0.06	0.003	95

One of the many innovative approaches to pest control at Sheppard AFB has been the use of nematodes; a microscopic, slender unsegmented worm, to control fire ants. Previously, virtually all fire ant control was accomplished by spraying a residual pesticide on baseboards or using an aerosol type contact pesticide. This practice only killed the ants in the existing area, and in a few days, these ants were replaced by other ants coming from the colony outside. The use of conventional ant bait seemed to provide the best type of fire ant control because they would take the bait into the colony as a food source and wipe out the entire colony. In 1998, the 82 CES Pest Management Shop released beneficial nematodes into the soil on and around fire ant mounds. The nematodes only attack fire ants and other insect pests such as white grubs and fleas, using them as a source of food. While not expected to entirely eliminate the fire ant problem,

the hope is that the nematodes will reduce the fire ant population to a more acceptable level and slow down the rapid advancement of this undesirable insect. More definitive results of this ant control method are expected to be available in Summer 1999.

Another innovative approach to pest management at Sheppard AFB has been the adoption of *"zero-chemical"* insecticides to control mosquitoes. In 1996, the Pest Management Section installed 24 Purple Martin birdhouses on base. Purple Martins feed on mosquitoes and are the only bird species totally dependent on humans for a supply of nesting sites. Along with the birds, the mosquito control program now uses 100% biological agents. Synthetic chemicals used in the past had a strong and unpleasant odor. The new chemicals, while just as effective as those used previously, present no danger to humans and have a far less objectionable odor.

As a result of these and other pesticide reduction initiatives, EPA Region 6 has recognized Sheppard's outstanding integrated pest management program as a model in Texas for pesticide reduction programs. For more information, contact Mr. Jimmy Lindsey, Entomology Section, 82 CES/CEOHH, (940) 676-2854.

Hazardous Materials Pharmacy

In January 1996, the 82nd Logistics Group (82 LG) at Sheppard AFB established a Hazardous Materials (HAZMAT) Pharmacy. In May 1998, a comprehensive review was performed of more than 825 line item authorizations, which had the potential to contribute approximately 36,000 – 40,000 pounds of hazardous waste annually to the base's waste streams. Driven by the requirements of Air Force Instruction (AFI) 32-7086, *Hazardous Materials Management*, a comprehensive review of over 55,000 individual HAZMAT items was completed, their usage recalculated, and new authorizations granted. This effort, completed in November 1998, resulted in the following reductions:

- 36% reduction in HAZMAT authorizations (825 to 534);

The 82nd Logistics Group (LG) Hazardous Materials Pharmacy (HAZMART) Team

Front row, l-r: Lt Burghard, Supply Flight Commander; Mr. Gregory G. Hall, 82 LG Environmental Coordinator; and Mr. Charles Boster, Raytheon Program Manager.

Middle row, l-r: Mr. B.J. Jorda, Raytheon Production Manager; Mr. Jake Jacobson, Trend-Western Material Handler; and Ms. Brenda Foard, Raytheon ESOH.

Back row, l-r: Mr. Steve Bodnar, Trend-Western Lead Inspector; Ms. Radonna Barnett, Trend-Western Supply Clerk; and Maj White, Commander, 82nd Logistics Squadron.

- 89% decrease in potential to contribute to hazardous waste streams (36,000-40,000 lbs. to 4,700 lbs. annually); and

- 79% reduction in the number of individual HAZMAT items (55,264 to 11,830).

Sheppard AFB enjoys an outstanding partnership with Raytheon Aerospace, one of its largest contractors. The dramatic reductions in HAZMAT use would not have been possible without support and cooperation from Raytheon, and empowerment by senior leadership. Responsible for over 1,000 pieces of aerospace ground equipment (AGE) and trainer aircraft, Raytheon has the potential to contribute significantly to Sheppard AFB's waste streams. Raytheon routinely reviews each AF Form 3952, "Chemical/Hazardous Material Request/Authorization," prior to purchase to determine if the item is actually required. In addition, the company completely bans the use chemicals such as 1,1,1-trichloroethane, perchloroethylene and methylene chloride.

For more information about Sheppard AFB's HAZMART, contact Mr. Gregory G. Hall, 82 LG Environmental Coordinator, DSN 736-1123.

"General Plan" Environmental Assessment

Billed as one of a kind, the September 1998 "Environmental Assessment (EA) for Installation Development on Sheppard AFB" establishes a projected "worst case" or maximum capacity for future development at the base. This "General Plan" EA, which cost $264K to produce, will be a "living" document for the next five to seven years. It anticipates environmental studies that could be needed at the base for unforeseen future missions and addresses environmental issues required for environmental assessments due in 1999. Geared for efficiency, use of the General Plan Environmental Assessment reduces the amount of time required to assess and report the "unexpected" from a minimum of 120 days, down to about 45 days, with 30 of those days set aside for public review as required by law.

The environmental effects being assessed, documented, and compiled in the General Plan will allow decision makers to evaluate future facility and mission plans in an environmental context, rather than making a decision and then looking at the environmental issues afterward. Finally, future EAs will be less costly and will be added to the General Plan for an ongoing overview of the base and its impact on the outside community. Mr. Tim Hunter estimates first year savings from the completion of three General Plan EAs have been $135K. For more information, contact Mr. Tim Hunter, 82 CES/CEVX, (940) 676-5698.

Solvent Distillation

The 80 FTW Corrosion Control shop has achieved tremendous environmental and monetary success through the use of new distillation units designed to process used solvent solutions. The waste solvents currently being redistilled include Safe-T-Solv, P-D-680, alcohol, and methyl ethyl ketone (MEK). The distillation unit is capable of returning some solvents to 99.9% of their original purity, allowing for significant savings in hazardous waste disposal costs and new product acquisition costs. For example, one distillation unit in operation 24 hours/day during 1997 processed a total of 18,300 gallons of spent solvents. Without the distillation unit, the Corrosion Control shop would have incurred disposal costs of over $113,000 and new product acquisition costs of over $60,000.

The distillation processes have been so successful at Sheppard AFB that plans are being made to provide distillation units for the entire base, at no additional cost to the government.

For more information, contact Mr. Pat Cassidy, Lockheed Martin, DSN 736-2416, or Mr. Dallas Tomlinson, 82 CES/CEVP, DSN 736-5719.

Permit Elimination

Sheppard AFB has successfully reduced their environmental compliance burden by eliminating the need to obtain an air emissions permit under Title V of the federal CAA. A rule interpretation request, prepared and submitted by Sheppard AFB (82 CES/CC), asked the Texas Natural Resource Conservation Commission (TNRCC) to issue a determination as to whether air emissions from on-base defense agencies such as the Army Air Force Exchange Service (AAFES), the Defense Commissary Agency (DECA), and the Defense Energy Supply Command (DESC) would be regulated separately from other on-base military air emissions under the control of the Base Commander. At issue was whether the on-base defense agencies were part of the Sheppard AFB "site" as defined in Title 30 Texas Administrative Code Chapter 122. This determination was necessary before the base could further determine if it would be categorized and regulated as a "Major Source" under the CAA.

In response, the TNRCC Operating Permits Division (OPD) confirmed that they considered the on-base defense agencies to be under separate control and not part of the Sheppard AFB "site," which included only those sources under control of the Base Commander. As a result of the TNRCC's determination, Sheppard AFB does not meet the CAA criteria for a "Major Source" and is not subject to the associated permitting requirements of the CAA.

For more information, contact Mr. Dallas Tomlinson, 82 CES/CEVP, DSN 736-5719.

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